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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,789	03/10/2004	Jeffrey A. Nelsen	200313995-1	4493

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EXAMINER
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LAMBELET, LAWRENCE EMILE

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 09/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/797,789

Applicant(s)

NELSEN ET AL.

Examiner

Lawrence Lambelet

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2006.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 and 21-24 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of Group I, claims 1-13 and 21-24, drawn to method, in the reply filed on 7/25/2006 is acknowledged. Applicant is advised that, as a result of the election, this case has been transferred to Art Unit (1732) and to a different examiner. Claim 14 will be included with the elected Group I. It is a method claim and appears to be inappropriately assigned to Group II.

Claims 15-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/25/2006.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14, 21-22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawford (U.S. Patent 6,936,212), and further in view of Zhang et al (U.S. Patent 6,253,116).

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Crawford discloses a method for solid free form fabrication (SFF), as recited in claims 1 and 21. Crawford teaches dispensing and solidifying successive layers of support and build materials. This is shown at lines 48-65 in column 1, 24-47 in column 8, and in claim 17 of the reference.

Crawford teaches that the build material is a thermoplastic or a wax (not a water-containing substance), as required by claims 1 and 7, at lines 1-20 in column 5.

Crawford teaches removing the support material by phase change, as required by claims 21 and 24, and as shown at lines 64-67 in column 8 and lines 21-25 in column 12.

Crawford teaches that the deposition materials, both support and build, are layered on a build platform or previous layer of solidified material, as required by claims 4 and 8. This is shown at lines 55-60 in column 1.

Crawford teaches that the deposition materials are dispensed from an inkjet print head, as required by claims 5 and 9 at lines 61-67 in column 4 and lines 24-27 in column 9.

Crawford teaches that the build and support materials can be on the same layer (substrate), as required by claims 11 and 22. This is shown at lines 64-67 in column 9.

Crawford teaches that the build and support materials solidify upon contact (thermal or chemical curing), as required by claims 12 and 13, and as shown at lines 1-5 in column 10.

Crawford teaches that structures are formed through successive layers of build material, as required by claim 14, at lines 48-50 in column 1.

Crawford does not teach that the support material is water or a fusible water-containing substance, as required by claims 1 and 21, or that the fusible water-containing substance is brine, as required by claims 2 and 3. Crawford further does not teach extruding support and build materials from a fused deposition modeling head, as required by claims 6 and 10.

Zhang et al, hereafter "Zhang", teaches brine as a support material at lines 12-26 in column 5. Zhang further teaches a continuous flow nozzle (fused deposition modeling head) at lines 10-20 in column 6 and in Fig. 3A.

Crawford and Zhang are combinable because they are concerned with a similar technical field, namely, SFF. One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Crawford the support material brine, as taught by Zhang, and would have been motivated to do so for environmental reasons.

Claims 1, 4-14, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawford, and further in view of Lombardi et al (U.S. Patent 6,437,034).

Crawford discloses a method for solid free form fabrication (SFF), as recited in claims 1 and 21. Crawford teaches dispensing and solidifying successive layers of support and build materials. This is shown at lines 48-65 in column 1, 24-47 in column 8, and in claim 17 of the reference.

Crawford teaches that the build material is a thermoplastic or a wax (not a water-containing substance), as required by claims 1 and 7, at lines 1-20 in column 5.

Crawford teaches removing the support material by phase change, as required by claims 21 and 24, and as shown at lines 64-67 in column 8 and lines 21-25 in column 12.

Crawford teaches that the deposition materials, both support and build, are layered on a build platform or previous layer of solidified material, as required by claims 4 and 8. This is shown at lines 55-60 in column 1.

Crawford teaches that the deposition materials are dispensed from an inkjet print head, as required by claims 5 and 9 at lines 61-67 in column 4 and lines 24-27 in column 9.

Crawford teaches that the build and support materials can be on the same layer (substrate), as required by claims 11 and 22. This is shown at lines 64-67 in column 9.

Crawford teaches that the build and support materials solidify upon contact (thermal or chemical curing), as required by claims 12 and 13, and as shown at lines 1-5 in column 10.

Crawford teaches that structures are formed through successive layers of build material, as required by claim 14, at lines 48-50 in column 1.

Crawford does not teach that the support material is water or a fusible water-containing substance, as required by claims 1 and 21. Crawford further does not teach removing support material by washing with water at ambient temperature, as required by claim 23. Crawford still further does not teach extruding support and build materials from a fused deposition modeling head, as required by claims 6 and 10.

Lombardi et al, hereafter "Lombardi", teaches that PEO is suitable for use as a support material at lines 8-15 in column 4. PEO is hydrophilic, and therefore a water-containing substance. Lombardi further teaches that PEO can be washed away with water at lines 5-10 in column 3. Since there is no heating, it can be assumed that the washing is at ambient temperature. Lombardi still further teaches extruding materials through a discharge head (fused deposition modeling head) at lines 45-67 in column 3.

Crawford and Lombardi are combinable because they are concerned with a similar technical field, namely, SFF. One of ordinary skill in the art at the time of the invention would have found it obvious to include in the method of Crawford and Zhang the alternate fusible material and temperature-friendly removal technique, as taught by Lombardi, and would have been motivated to do so to avoid depressed temperature operating conditions.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Lambelet whose telephone number is 571-272-1713. The examiner can normally be reached on 8 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LEL  
8/24/2006

  
**CHRISTINA JOHNSON**  
**PRIMARY EXAMINER**  
8/24/06